

Mallery, who requested an Indian to make the sign for a steamboat—an object seen for the first time a few days before. “After thinking a moment he gave an original sign, described as follows:—Make the sign for water by placing the flat right hand before the face, pointing upward and forward, the back forward, with the wrist as high as the nose; then draw it down and inward toward the chin; then with both hands indicate the outlines of a horizontal oval figure from before the body back to near the chest (being the outline of the deck); then place both flat hands, pointing forward, thumbs higher than the outer edges, and push them forward to arm’s length (illustrating the powerful forward motion of the vessel).”

The indications given by a notice of these two papers will show that an important addition has been made to the number of scientific journals. Into the purely philological papers it would be improper for us to enter here.

PROCEEDINGS OF LEARNED SOCIETIES.

GEOLOGICAL SOCIETY.

June 25, 1884.—Prof. T. G. Bonney, D.Sc., F.R.S.,
President, in the Chair.

The following communications were read:—

1. “On some Fossil Calcisponges from the Well-boring at Richmond, Surrey.” By Dr. G. J. Hinde, F.G.S.

Numerous specimens of diminutive sponges were met with in a band of calcareous shale in the Richmond well-boring, at a depth of 1205 feet beneath the surface. They proved to be all Calcisponges belonging to Zittel’s family of Pharetrones. Five species, all new, were described, and referred to the genera *Inobolia*, *Peronella*, *Blastinia*, and *Oculospongia*. The spicular structure of the fibres can be seen in microscopic sections of the different species, and in some examples even the spicules of the dermal layer are preserved. From the general facies of the specimens, and the fact that one species is closely allied to *Blastinia costata*, Goldf., from Lower Jurassic strata at Stroitberg, the author thought it probable that the stratum in which the sponges occur is of Lower Jurassic age.

2. “On the Foraminifera and Ostracoda from the deep Boring at Richmond.” By Prof. T. Rupert Jones, F.R.S., F.G.S.

From some strata at three special depths (§ i. 1145’ 9” to 1146’ 6” ; § ii. 1151’ to 1151’ 6” ; and § iii. 1205’) in the deep boring at Richmond, several Foraminifera and Ostracoda have been obtained by Prof. Judd, but they do not present any very special characteristics recognizable as belonging to particular horizons. The Foraminifera comprise several common forms or varieties of *Cristellaria*, *C. rotulata* occurring at each of the depths

alluded to. Specimens of the *Nodosarinæ* occur very rarely in the lowest stratum of the three; also *Spirillina*, *Pulvinulina* (of the *elegans* type), several small individuals of *Planorbulina Haidingeri*, and vars., and one small *Miliola*.

Of the Ostracoda there are several forms not previously published; and, for the most part, they differ in the three stages alluded to; but one *Cythere* occurs in § i., § ii., and § iii.; one in § i. and § iii.; and a *Cytherella* in § ii. and § iii.

Excepting a general Upper Mesozoic aspect, these limited groups offer no special characteristic so far as yet examined.

3. "Polyzoa (Bryozoa) found in the Boring at Richmond, Surrey, referred to by Prof. J. W. Judd, F.R.S." By G. R. Vine, Esq. Communicated by Prof. Judd, F.R.S., Sec. G.S.

The Bryozoa from the Richmond well, which are in an admirable state of preservation, include no less than 14 different forms, most of which are characteristic of the Great Oolite of this country and the continent. Two or three forms, however, are new, and detailed descriptions were given of them in the present paper. Six of the forms found at Richmond occur also among the fossils collected by the late Mr. C. Moore from the oolitic rock met with in the boring at Messrs. Meux's Brewery.

4. "On a new Species of *Conoceras* from the Llanvirn Beds, Abereddy, Pembrokeshire." By T. Roberts, B.A., F.G.S., Woodwardian Museum, Cambridge.

This new species of *Conoceras* was obtained by the author from a new quarry about half a mile to the north-west of the Llanvirn quarry, Abereddy.

The fossil consists in great part of a mould of the shell, together with a much compressed, obliquely cut, longitudinal section of the shell itself, which can be removed from its mould. On the posterior part of the fossil the course of the sutures of the septa can be fairly well seen: after passing upwards for a short distance, the sutures bend forward, and, meeting those from the opposite side, which are similarly bent, form a band of superposed chevrons, situated mesially in this part of the fossil. When the shell is removed from its mould the chevron band appears to be distorted, and is then continued forward as a narrow, partly disconnected groove, to the anterior margin of the fossil. There is a ridge on the shell itself corresponding to this groove, which the author considers to be the siphuncle.

On the anterior part of the fossil coarse corrugations are present which correspond to the lines of growth of the shell. The body-chamber is not preserved.

Only 5 species of *Conoceras* have as yet been described; the author compared the Llanvirn species with these, and also with a fossil from the Devonian of Nassau, which Kayser referred to *Gomphoceras*, but which possesses several characters in common with *Conoceras*.

The horizon from which this new species was obtained is that of the Llanvirn Beds, some typical Llanvirn fossils having been found with it. The author named the species *Conoceras llanvirmensis*.

5. "Fossil Cyclostomatous Bryozoa from Australia." By A. W. Waters, Esq., F.G.S.

In the present paper the Cyclostomata from Curdies Creek, Mount Gambier, Bairnsdale, Muddy Creek, &c., Aldinga and River-Murray Cliffs were described, bringing the total number of fossil Bryozoa from Australia, dealt with in this series of papers, up to 195, of which 85 are known living. Of the 32 Cyclostomata now dealt with, 12 at least are known living, and one cannot be distinguished from a Palæozoic form; 9 are apparently identical with European Cretaceous fossils.

Although so many remind us of European Chalk and Miocene species, great stress was laid upon the imperfect data available for such comparisons, the Cyclostomata furnishing but few characters which are available for classification, which, so far, has almost entirely been based upon the mode of growth, which, in the Chilostomata, has been shown to be of secondary value. In consequence of the few available characters the Cyclostomata do not seem likely to be ever so useful palæontologically as the Chilostomata, and as they are less highly differentiated, it is not surprising to find that they are more persistent through various periods.

In order to see how far other characters might be available, the author has examined Cyclostomata, both recent and fossil, from many localities and strata, and pointed out that the size of the zoecia should always be noticed, as also the position of the closure of this tube. The arrangement of the interzoecial pores may frequently give great assistance, and these are considered the equivalents of the rosette-plates; but the most useful character of all is no doubt the ovicell, which varies specifically in position and structure; but this unfortunately occurs on but few specimens, and has rarely been described fossil, although greater attention to this will no doubt lead to its being frequently found and noticed.

6. "A Critical and Descriptive List of the Oolitic Madreporaria of the Boulonnais." By R. F. Tomes, Esq., F.G.S.

The author commenced with some general remarks upon certain Oolitic genera of Corals, especially *Bathycœnia*, *Cyathophora*, and *Depaphyllum*. He stated that his observations upon the Corals of the Great Oolite of the Boulonnais confirm the conclusions as to the palæontological uniformity of that formation based by Dr. Lycett chiefly on the study of the Mollusca. In the Boulogne district the Great Oolite rests immediately upon Palæozoic rocks, and there are no traces of any Corals of Inferior-Oolite type. Those met with near the bottom of the Great Oolite seem to approach those of the English Cornbrash. After a tabular sketch of the different beds of Oolitic age in the Boulonnais, the author gave a list of the species as follows:—

From the Great Oolite:—*Discocœnia bononiensis*, g. & sp. n.;

Ceratocœnia elongata, g. & sp. n.; *Scyphocœnia staminifera* and *excelsa*, g. & sp. n.; *Bathyœnia hemispherica*, sp. n.; *Conveastrœa Waltoni*, E. & H.; *Cryptocœnia obeliscus*, Mich.; *C. plana*, sp. n.; *C. Rigaudi*, sp. n.; *C. microphylla*, Tomes; *Stylina*, sp.; *Montlivallia caryophyllata*, Lamx.; *M. Rigaudi*, sp. n.; *Cladophyllia Babeana*, E. & H.; *Septastrœa rigida*, sp. n.; *Confusastrœa Rigaudi*, sp. n.; *C. magnifica*, Tomes; *Confusastrœa*, sp.; *Isastrœa limitata*, Lamx.; *I. explanata*, Goldf.; *I. tuberosa*, sp. n.; *Latimœandra*, sp.; *L. lotharinga*, From.; *Thamuastrœa mammosa*, E. & H.; *Anabacia complanata*, DeFr.; *A. Bouchardi*, E. & H.; *Genabacia stellifera*, E. & H.; and *Microsolena excelsa*, E. & H. From the Coral Rag: *Stylina*, 2 sp.; *Cladophyllia pseudostylina*, Mich.; *Rhabdophyllia Phillipsi*, E. & H.; *Thecosmilia annularis*, E. & H.; *Confusastrœa*, sp.; *Dimorphophyllia jurensis*, Beck.; *Latimœandra sequana*, From.; *Isastrœa explanata*, Goldf.; *I. helianthoides*, Goldf.; *I. portlandica*, From.; *Trochoseris ooliticæ*, sp. n.; *Thamuastrœa? latimœandroidea*, sp. n.; *T.? concinna*, Goldf.; *T. foliacea*, Quenst.; *T. gibbosa*, Beck.; *Microsolena expansa*, Etall.; and *Comoseris irradians*, E. & H.

7. "On the Structure and Affinities of the family Receptaculitidæ, including therein the genera *Ischadites*, Murch. (= *Tetragonis*, Eichw.), *Sphaerospongia*, Pengelly, *Acanthochonia*, g. n., and *Receptaculites*, DeFr." By Dr. G. J. Hinde, F.G.S.

The author's observations have been derived from the study of numerous examples of the family from Silurian and Devonian strata in Devonshire, the west of England, Belgium, Silesia, Bohemia, the isle of Gotland, Canada, and the United States. In an historical sketch the author showed that the members of this group have been at various times referred to pine-cones, Foraminifera, sponges, corals, cystideans, and tunicate Mollusca, and that the latest authorities who have written on them consider their systematic position as altogether doubtful.

The present mineral constitution of these fossils is either of crystalline calcite, silica in a secondary condition, iron peroxide, or iron pyrites, or they occur as empty moulds, and from the similarity to the present mineral condition of undoubted siliceous sponges, the author thinks that the Receptaculitidæ were also originally siliceous. The skeleton of the members of the group consists of modified hexactinellid spicules, in which the summit-ray of the spicule is changed into a rhomboidal or hexagonal plate with the four horizontal rays or arms immediately beneath it, whilst the vertical ray or shaft tapers to a point, and terminates freely in *Ischadites* and *Acanthochonia*; in *Sphaerospongia* it is partially absorbed; and in *Receptaculites* it develops a plate at its distal extremity. The spicular rays are traversed by axial canals, as in other hexactinellid spicules, and these unite in the central point of junction of the rays. The spicules are definitely arranged so that their summit-plates form regularly oblique rows crossing each other, and the horizontal rays radiating and transverse rows.

The genus *Ischadites* consists of conical or ovate bodies enclosing a central cloacal cavity with a summit-aperture. The basal nucleus or commencement of growth consists of eight small spicules arranged in a circle; the spicule-plates are rhomboidal; there is no inner plate, as in *Receptaculites*. The genus *Tetragonis*, Eichw., is undoubtedly congeneric with *Ischadites*, and, being of later date, becomes obsolete. *Acanthochonia*, g. n., resembles *Ischadites* in spicular structure, but it is open cup-shaped; it is formed to include a single species, named *A. Barrandei*, from Bubowitz, in Bohemia. The genus *Spherospongia*, Pengelly (pars Salter), has hexagonal summit-plates, and the vertical spicular rays are only partially developed. The genus *Receptaculites* is cup-shaped; the spicular plates are rhomboidal, and the vertical rays develop at their extremities definite plates, which apparently amalgamate into a continuous perforated layer. The author concluded that the Receptaculitidæ constitute a distinct family of siliceous hexactinellid sponges, whose nearest relationships are to *Protospongia*, *Dictyophyton*, and *Plectoderma*.

The genera *Cyclocrinus*, Eichw. (= *Nidulites*, Salter), *Pasceolus*, Billings, and *Archæocyathus*, Bill., though ranged with the Receptaculitidæ by some authors, were shown to have no structural relationship to that family.

8. "On the Pliocene Mammalian Fauna of the Val d'Arno." By Dr. C. J. Forsyth Major. Communicated by Prof. W. Boyd Dawkins, F.R.S., F.G.S.

A list of the fossil Mammalia was given, containing the names of thirty-nine species known to the author. This list contains no species common to the older fauna on the limit between Miocene and Pliocene, a fauna characterized by the presence of *Hipparion* and met with at Pikermi, Eppelsheim, and other places. The Montpellier fauna contains an admixture of older and newer types; but it is not clear that this admixture has not taken place after extraction. Some Val d'Arno types extend to the Sewaliks of Northern India, for *Equus Stenonis* and *Sus Strozzi* of the former are probably the same as *E. sivalensis* and *Sus giganteus* of the latter.

It has been asserted that the marine Pliocene of Italy is older than the lacustrine strata of the Arno valley. This, however, is not the case; some of the mammalian species found in the latter occur also in shore-deposits belonging to the first named.

The Pleistocene fauna in Italy appears to be quite distinct specifically from the Pliocene. Portions of both, however (often designated the African division), appear to be closely allied. This is especially the case with certain forms of *Hyæna*, *Felis*, *Rhinoceros*, and *Hippopotamus*. Some of the differences between species of the two last-named genera were discussed.

The relations of the Arno-valley fauna to living Mammalia were next considered, and it was shown that although some genera, as *Hippopotamus*, are only met with living in the Ethiopian region, a much larger number of forms, such as *Tapirus* and several bovine and

cervine species, are now represented in south-eastern Asia and the Sunda islands. The occurrence of these animals in tropical countries at the present day does not, however, necessarily imply a tropical climate in Pliocene Italy. Some instances in modern geographical distribution are quoted in illustration of this opinion. It is probable that the Pliocene fauna of Europe extended as far as Celebes, and has been preserved in the Indian archipelago by isolation.

In conclusion it was shown that the preservation of a Miocene form, *Myolagus sardonis*, in the Pleistocene bone-breccias of Corsica and Sardinia, and the occurrence of *Elephas meridionalis* and *Mastodon arvernensis* in beds of different age on opposite sides of the Alps, are instances in support of the view that a single mammalian species or even a few species cannot be sufficient to determine the age of beds.

In a note appended to the paper, Prof. Boyd Dawkins contested the opinion that no species pass from Miocene to Pleistocene beds, especially in the case of *Hippopotamus major* of the former and *H. amphibius* of the latter.

9. "Notes on some Cretaceous Lichenoporidæ." By G. R. Vine, Esq. Communicated by Prof. P. Martin Duncan, F.R.S., F.G.S.

In this paper the author referred to the views of Mr. Hincks on the genera belonging to the family Lichenoporidæ, and especially to his suppression of the genus *Radiopora* of D'Orbigny, the species of which are placed by Mr. Hincks in the genus *Lichenopora*. The author remarked that the type species of the division of the latter genus identified by Mr. Hincks with *Radiopora*, D'Orb., the Lower Greensand *Radiopora pustulosa*, D'Orb., and other fossil species show structural peculiarities which would seem to distinguish them, although perhaps not generically. He described in some detail the characters of the above-mentioned species under the name of *Lichenopora pustulosa*; and further described what he believed to be a new species from the Greensand of an unknown locality under that of *Lichenopora paucipora*.

MISCELLANEOUS.

On Paludicella erecta.

MR. EDWARD POTTS desired to have a preliminary record made of his recent discovery or identification of a new species of *Paludicella* for which he proposes the name of *Paludicella erecta*.

This genus of freshwater Polyzoa has heretofore contained only the single clearly defined species *P. Ehrenbergi*, Van Beneden (*Alcyonella articulata*, Ehrenberg), the other two names, *P. procumbens* and *P. elongata*, suggested by Mr. Albany Hancock and Prof. Leidy, being considered by Prof. Allman as identical with the original type. The present form is strikingly different from the old one, both in the number of its ciliated tentacles and in the character of the cœnœcial cells. The doubt which has lingered in the mind